

# PATENT SPECIFICATION

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## DRAWINGS ATTACHED

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## (54) HEATING APPARATUS

(71) We, DAVID R. LORD LIMITED, a British Company, of 8, Timberley Lane, Castle Bromwich, Birmingham B34 7EJ, do hereby declare the invention for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to heating apparatus of the kind comprising tubing, and gas fired combustion equipment from which the products of combustion are passed through the tubing to provide a source of radiant heat.

Such appliances are usually used to heat large spaces such as workshops or other industrial premises.

The object of the invention is to provide apparatus of the kind referred to which is efficient and compact.

In accordance with the present invention, heating apparatus comprises a U-shaped tube, a gas fired combustion unit at one end of the tube arranged to discharge the products of combustion into the tube, the other end of the tube being connected to an outlet duct in which is disposed an extraction fan, the tube, gas fired combustion unit and the outlet duct with the fan being mounted upon a support structure which incorporates a reflector.

The invention will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is a perspective view of a heating apparatus constructed in accordance with the invention.

Figure 2 is a view of the U-shaped tube forming the principal part of the heating apparatus, and

Figure 3 is a cross sectional view on an enlarged scale on the line 3—3 in Figure 1.

The heating apparatus comprises a support structure which is seen in cross-section in Figure 3. The structure comprises three sets of upper and lower interconnected bars 10, 11 which are spaced lengthwise of the apparatus. The lower bar 10 of each set has upwardly presented

screw-threaded ends. Connected to each pair of bars by means of nuts fitting onto the ends of the bars 10, are respective angle section members 12 to which may be connected suspension chains indicated at 13 in Figure 1, or which serve as brackets whereby the apparatus can be clamped to a horizontal, inclined or vertical surface.

The structure also includes a longitudinally corrugated reflector plate 14 which serves to connect the set of bars 10, 11 and the angle section members 12 together.

The structure supports a U-shaped tube 15, which is constructed from three pieces, as illustrated in Figure 2. The tube is supported in the structure by means of the pairs of bars 10, 11.

The two open ends of the tube 15 extend beyond one end of the reflector plate 14, and to one of the open ends is connected a gas fired combustion unit indicated at 16. This unit incorporates a burner mounted adjacent to an air inlet opening and a control unit whereby electrical control of the gas is achieved. Ignition is by means of a permanent pilot jet.

An inlet pipe 17 is connected to the unit by means of a coupling and shut-off valve 18.

One open end 24 of the tube 15 is connected to an outlet duct 19 which in turn is connected to an exhaust duct 20. The outlet duct 19 is part of the casing of a rotary fan 21 which serves to extract the gases from within the tube 15. A motor is provided to drive the shaft 22 of the fan 21 and this unit is designed to withstand the temperatures which are generated in the apparatus.

Adjacent to the inlet of the fan 21 is a switch 23 which is actuated when the pressure in the tube reaches a predetermined low value. The switch 23 is wired electrically to a flame failure gas control unit. By means of this control apparatus the fan motor must be running at a sufficient speed to operate this switch 23 before a main gas supply valve solenoid can operate to apply full gas supply. If the fan motor

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fails, the switch 23 contacts open and shut off main gas supply.

5 In use, the fan 21 draws the products of combustion from the gas fired combustion unit 16 so that the tube 15 is substantially heated by the passage of these combustion products. The tube 15 serves as a radiant heating element, the direction of radiation of which is controlled by means of the  
10 reflector plate 14.

In an alternative construction, more than one U-shaped tube is provided upon a single support structure. Each U-shaped tube has its associated gas combustion unit but the  
15 tube outlet ends are connected together in pairs or groups of larger numbers, each with a single outlet with a single fan.

WHAT WE CLAIM IS:—

20 1. Heating apparatus comprising a U-shaped tube, a gas fired combustion unit at one end of the tube arranged to discharge the products of combustion into the tube, the other end of the tube being connected to an outlet duct in which is disposed an  
25 extraction fan, the tube, gas fired combustion unit and the outlet duct with the fan

being mounted upon a support structure which incorporates a reflector.

2. Heating apparatus as claimed in Claim 1 in which there is more than one U-shaped tube mounted upon the support structure, the tubes having respective gas fired combustion units, but their outlets being connected to a common fan. 30

3. Heating apparatus as claimed in Claim 1 or Claim 2 in which the or each tube outlet end has a switch connected electrically to a gas supply means and actuatable when the fan generates a pressure in said outlet below a predetermined value. 35

4. Heating apparatus as claimed in any one of the preceding claims in which the support structure has means for mounting it in a position of use. 40

5. Heating apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 45

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